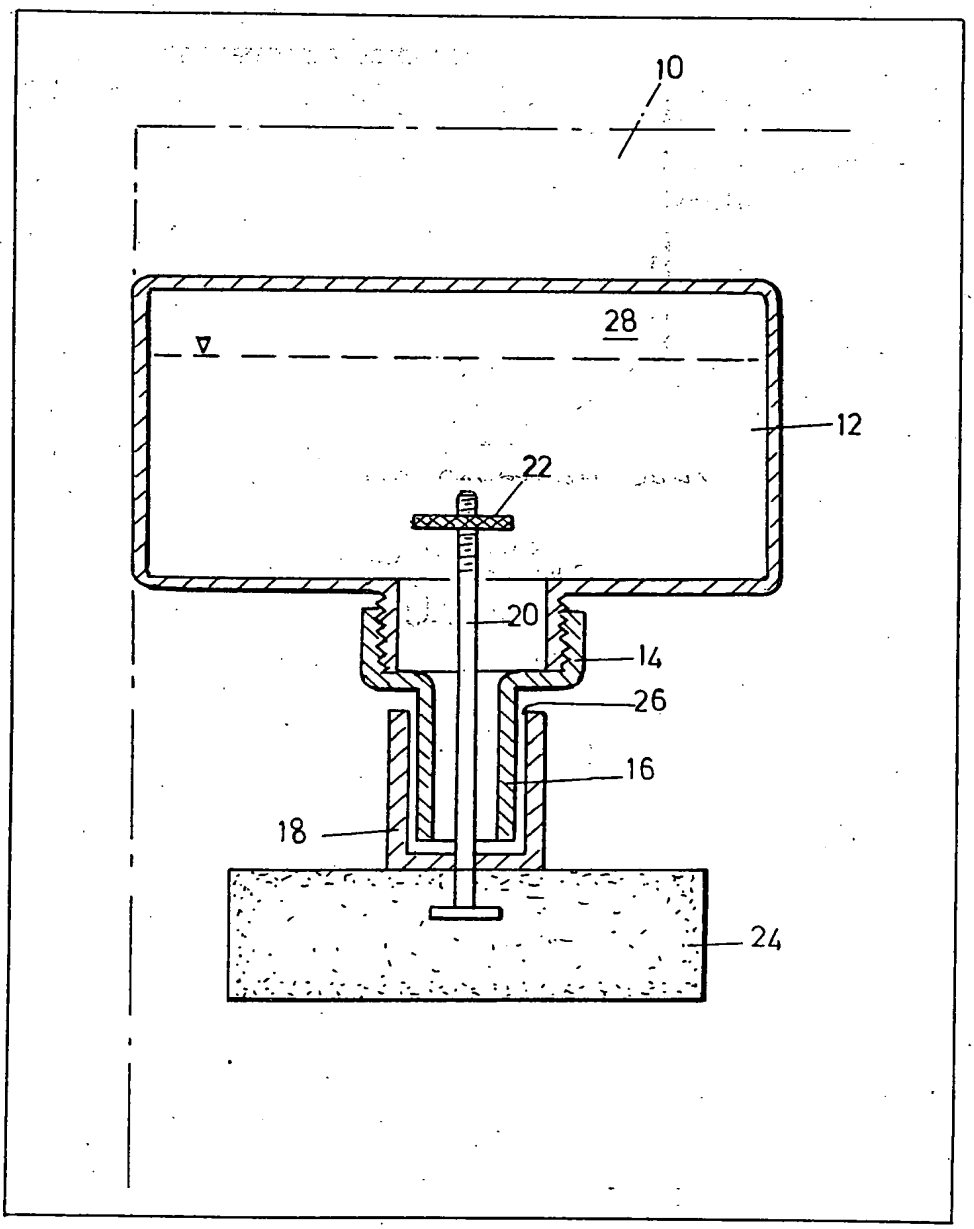
(12) UK Patent Application (19) GB (11) 2 086 844 A

(21) Application No 8035415
(22) Date of filing 4 Nov 1980
(43) Application published
19 May 1982
(51) INT CL³
G01F 11/02 E03D 9/03
(52) Domestic classification
B8N KA
E1C 22B3 22B4
(56) Documents cited
GB 2007191A
GB 399603
(58) Field of search
B8N
E1C
(71) Applicant
Brian Anthony Hewson,
17 St. Andrews Avenue,
Senderwood,
Bedfordview, Transvaal,
South Africa
(72) Inventors
Brian Anthony Hewson,
Ronald Ernest Rodel
(74) Agents
Gallafent & Co.,
8 Staple Inn, London
WC1V 7QH

(54) Method and apparatus for dosing liquids

(57) Quanta of dosant liquid confined in an impermeable container (12) are withdrawn gravitationally from the container into a receiver (18) open to atmosphere, thereby causing the pressure in the free space in the container to be reduced to bring the system into hydrostatic equilibrium. Each quantum is discharged from the receiver into the liquid to be dosed, to allow a fresh quantum to be withdrawn from the container. The receiver (18) is moved by a float (24) responsive to the level of liquid in the chamber (10), e.g. a cistern. The dosant liquid may be disinfectant or a nutrient.



The drawing originally filed was informal and the print here reproduced is taken from a later filed formal copy.

GB 2 086 844 A

SPECIFICATION

Method and apparatus for dosing liquids

The invention lies in the field of dispensers for dosing liquids with fluent dosants. Examples are the dosing of disinfectant into water closets and of nutrients into animals' drinking water.

Numerous forms of dosers have been proposed and many put to use. The commonest defect of such known dosers is the presence of mechanisms such as valves which, owing to the nature of the dosant, tend to clog and which have therefore to be inspected and cleaned or replaced periodically. The object of the present invention is to provide a dosing method, and dosing apparatus which has no valves or other mechanism apt to clog, and which is cheap to fabricate, easy to instal and requires minimal maintenance.

According to the invention, a method of dosing a liquid with a fluent dosant consists in confining a body of the dosant in an impermeable container, causing a quantum of the dosant to be withdrawn gravitationally from the body into a receiver open to atmosphere, thereby causing the pressure in the free space above the body to be reduced and bringing the system into a state of hydrostatic equilibrium; and discharging the quantum from the receiver into the liquid to be dosed to allow a fresh quantum to be withdrawn from the container.

Further according to the invention, the receiver is movable relatively to the container in the vertical direction, and in which the quantum in the receiver is discharged by causing the receiver to move upwardly and thereby cause its contents to spill into the liquid to be dosed.

Apparatus to dose liquid with a fluent dosant consists of a container for the dosant that is air-impermeable, means to fill the container, an outlet pipe for gravitational flow of dosant from the container, a vessel located below the container to receive a quantum of dosant from the pipe, the vessel being telescopic with the pipe and open to atmosphere, means to limit downward movement of the vessel and means to discharge the contents of the vessel into the liquid to be dosed.

The means to discharge the receiver may be a float that is attached to it and which, when it is lifted by the liquid being dosed, causes the receiver to empty.

An embodiment of the invention is illustrated in the accompanying drawing which is a schematic sectional side view of the dispenser.

In the drawing, the liquid to be dosed is a volume of water contained in a cistern 10 which is part of a water closet. The dispenser or doser consists of a container 12 that has a filler aperture in its base, closed by a cap 14. The cap has a downwardly extending pipe 16. A cup 18 surrounds the pipe 16 telescopically. Its inner diameter is larger than the outer diameter of the pipe, so that its cavity is open to the atmosphere. The cup is limited in its downward telescoping movement relatively to the pipe by a rod 20 that projects upwardly through the pipe and terminates within the cavity of the cap 14. The end of the rod is screw-threaded and carries a nut 22 that, when it comes against the upper end of the pipe within the cap, puts an end to downward movement of the rod and hence the cup. By adjusting the nut 22 on the rod, the movement of the cup relatively to the pipe can be varied.

The cup is attached to a float 24.

The container, when in use, is impermeable to atmospheric air.

In use, the container is removably mounted within the cistern 10 in any suitable manner, with the float hanging downwardly. The container has previously been filled with dosant and the cap 14 is screwed firmly in place.

When the cistern is empty, the cup 18 is at its lowermost position with the nut 22 against the upper end of the pipe 16, but not sealing it. Dosant has flowed gravitationally from the container to fill the cup. Since the system is sealed from the atmosphere except for the annular surface 26 of dosant in the cup, filling of the cup has created a reduced pressure in the free space 28 above the body of dosant in the container. This partial vacuum, together with the atmospheric pressure on the annulus 26 of dosant, brings the system into a state of hydrostatic equilibrium with no spillage of dosant over its lip.

Water then enters the cistern and, as it rises, it lifts the float until the cup bottoms on the lower end of the pipe. While this is happening, a quantum of dosant in the cup is caused to spill out over its edge into the cistern. The lip is, of course, always above water level, so that no water can enter the cup.

The pipe is still full of dosant as is the annulus between the pipe and the cup, and the system is again in hydrostatic equilibrium and no dosant enters the cistern.

At the next flush of the cistern, the float descends, the cup drops with it and dosant enters the cup to fill it. Again, owing to the barometric effect due to withdrawal of dosant from the sealed container, flow of dosant into the cup is arrested when the cup has reached its lower limit of travel; and the cycle is repeated.

Adjustment of the position of the cup on the rod varies the lower limit of travel of the cup and therefore of the quantity of dosant ejected from the cup during its upward travel. The longer the travel of the cup, the greater will be the quantum of dosant dispensed.

Since the dispenser has no working parts the interaction of which can be affected by precipitation of solids from the dosant, the dispenser is trouble-free and requires substantially no maintenance.

CLAIMS

1. A method of dosing a liquid with a fluent dosant, which consists in confining a body of the dosant in an impermeable container, causing a quantum of the dosant to be withdrawn gravitationally from the body into a receiver open to atmosphere, thereby causing the pressure in

the free space above the body to be reduced and bringing the system into a state of hydrostatic equilibrium; and discharging the quantum from the receiver into the liquid to be dosed to allow a fresh quantum to be withdrawn from the container.

2. The method of Claim 1 in which the receiver is movable relatively to the container in the vertical direction, and in which the quantum in the receiver is discharged by causing the receiver to move upwardly and thereby cause its contents to spill into the liquid to be dosed.

3. A dispenser for dosing fluent dosant into a liquid, which consists of a container for the dosant that is air-impermeable, means to fill the container, an outlet pipe for gravitational flow of dosant from the container, a vessel located below the container to receive a quantum of dosant from the pipe, the vessel being telescopic with the pipe and open to atmosphere, means to limit downward movement of the vessel, and means to discharge the contents into the liquid to be dosed.

4. The dispenser of Claim 3 in which the discharging means comprises a float attached to the vessel.

5. The dispenser of either of Claims 3 or 4 in which the means to limit downward movement of the vessel is adjustable to vary the dosage.

6. The dispenser of Claim 5 in which the adjustable means is a rod that is connected to the vessel to limit its downward movement and the effective length of the rod is adjustable.

7. A method of dosing liquid with a fluent dosant substantially as herein described.

8. A dispenser for dosing liquid with a fluent dosant substantially as herein described with reference to the accompanying drawing.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1982. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.